

TESTING OF TRANSIMPEDANCE AMPLIFIERS

ABSTRACT

Testing is performed on an amplifier wafer housing a transimpedance amplifier prior to packaging the transimpedance amplifier with an external photodetector, wherein the transimpedance amplifier includes a small, auxiliary, integrated silicon photodetector provided at the input of the transimpedance, in parallel with external photodetector attachment points. The small auxiliary photodetector does not significantly affect the high speed performance of the transimpedance amplifier. The small auxiliary photodetector is provided to facilitate wafer-level testing at the transimpedance amplifier input. To test the transimpedance amplifier, the transimpedance amplifier is stimulated by optically exciting the small auxiliary photodetector, wherein the small auxiliary photodetector is excited using short wavelength light, whereby advantages such as higher efficiency may be obtained. The testing method includes placing the amplifier wafer in a testing system, probing the power and ground connections on the amplifier wafer, illuminating the small auxiliary photodetector on the amplifier wafer, and detecting the output of the transimpedance amplifier housed on the amplifier wafer. The output of the transimpedance amplifier may be detected by probing the supply voltage and detecting the switching currents passing through a bias tee using a spectrum analyzer, using a high gain antenna and a sensitive narrow band receiver, or using a high speed electrical probe.

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